

WHAT IS CLAIMED IS:

1. A handle having a torque limiter usable in a device having an operating mechanism (5) moving vertically according to the rotation of a handle element (6), the handle element (6) comprising:
 - 5 a cover portion (61) configured to move down by being rotated and stop at the predetermined lowest position;
 - a handle body (62) disposed inside said cover portion and having a lower portion that is connected to said operating mechanism;
 - said cover portion (61) comprising:
 - 10 receiving holes (61a) disposed therein;
 - elastic bodies (7) inserted in said receiving holes (61a) for pushing down said operating mechanism (5);
 - a transmitting member (8) disposed at one end of said elastic bodies for transmitting the pushing force of said elastic
 - 15 bodies to said handle body;
 - wherein said elastic bodies push down said operating mechanism (5) with a minimum pushing force to obtain desired effect when said cover portion reaches said predetermined lowest position;
 - said handle body having on its upper surface a ring-shaped concave
 - 20 portion (62) for engaging therein a transmitted member (10) to which the bottom surface of said transmitting member is pressed,
 - wherein said transmitted member has a serration on its surface facing said transmitting member or said transmitting member has a serration on its surface facing said transmitted member;
 - 25 said serration comprises inclined surfaces (81, 101) and vertical surfaces (82, 102) that are alternately arranged in a circumferential

direction; and

said inclined surfaces are tilted upwardly along the direction in which said cover portion is rotated to move down.

2. A handle having a torque limiter usable in a device having
5 an operating mechanism (5) moving vertically according to the
rotation of a handle element (6), the handle element (6) comprising:
a cover portion (61) having a lower portion that is connected to said
operating mechanism and configured to move down by being rotated
and stop at the predetermined lowest position;
10 a handle body (62) disposed inside said cover portion;
said handle body comprising:

receiving holes (61a) disposed therein;
elastic bodies (7) inserted in said receiving holes (61a) for
pushing down said operating mechanism (5);
15 a transmitting member (8) disposed at one end of each of said
elastic bodies for transmitting the pushing force of said
elastic bodies to said handle body;

wherein said elastic bodies push down said operating mechanism (5)
with a minimum pushing force to obtain desired effect when said cover
20 portion reaches said predetermined lowest position;

said cover portion having therein a ring-shaped concave portion
(62a) opening downwardly, said concave portion engaging therein a
transmitted member (10) to which the upper surface of said transmitting
member is pressed,

25 wherein said transmitted member has a serration on its surface
facing said transmitting member or said transmitting member has a

serration on its surface facing said transmitted member;

said serration comprises inclined surfaces (81, 101) and vertical surfaces (82, 102) that are alternately arranged in a circumferential direction; and

5 said inclined surfaces are tilted upwardly along the direction in which said cover portion is rotated to move down.

3. A fluid controller (1) comprising:

valve casing (2) having fluid channel (21) therein;

valve membrane (3) for opening and closing said fluid channel;

10 an operating mechanism (5) having a lower end that is connected to the upper side of said valve membrane;

a handle element (6) for vertically moving said operating mechanism; said handle element comprising:

15 a cover portion (61) configured to move down by being rotated and stop at the predetermined lowest position;

a handle body (62) disposed inside said cover portion (61) and having a lower portion that is connected to said operating mechanism;

said cover portion comprising:

20 receiving holes (61a) disposed therein;

elastic bodies (7) inserted in said receiving holes (61a) for pushing said operating mechanism (5) downwardly;

a transmitting member (8) disposed at one end of said elastic bodies for transmitting the pushing force of said elastic
25 bodies to said handle body;

wherein said elastic bodies push down said operating mechanism (5)

with a minimum pushing force to obtain desired effect when said cover portion reaches said predetermined lowest position;

said handle body having on its upper surface a ring-shaped concave portion (62) for engaging therein a transmitted member (10) to which the
5 bottom surface of said transmitting member is pressed,

wherein said transmitted member has a serration on its surface facing said transmitting member or said transmitting member has a serration on its surface facing said transmitted member;

said serration has inclined surfaces (81, 101) and vertical surfaces
10 (82, 102) that are alternately arranged in a circumferential direction; and

said inclined surfaces are tilted upwardly along a direction in which said cover portion is rotated to move down.

4. A fluid controller (1) comprising:
valve casing (2) having fluid channel (21) therein;
15 valve membrane (3) for opening and closing said fluid channel;
an operating mechanism (5) having a lower end that is connected to the upper side of said valve membrane;
a handle element (6) for vertically moving said operating mechanism; said handle element comprising:

20 a cover portion (61) configured to move down by being rotated and stop at the predetermined lowest position;
a handle body (62) disposed inside said cover portion (61) and having a lower portion that is connected to said operating mechanism;

25 said handle body comprising:
receiving holes (61a) disposed therein;

elastic bodies (7) inserted in said receiving holes (61a) for pushing said operating mechanism (5) downwardly;

a transmitting member disposed at one end of each of said elastic bodies for transmitting the pushing force of said elastic bodies to said handle body;

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wherein said elastic bodies push down said operating mechanism (5) with a minimum pushing force to obtain desired effect when said cover portion reaches said predetermined lowest position;

said cover portion having therein a ring-shaped concave portion (62a) opening downwardly, said concave portion engaging therein a transmitted member (10) to which the upper surface of said transmitting member is pressed,

wherein said transmitted member has a serration on its surface facing said transmitting member or said transmitting member has a serration on its surface facing said transmitted member;

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said serration has inclined surfaces (81, 101) and vertical surfaces (82, 102) that are alternately arranged in a circumferential direction; and

said inclined surfaces are tilted upwardly along a direction in which said cover portion is rotated to move down.

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5. A fluid controller according to either claim 3 or 4,

wherein said transmitting member having on its surface facing said transmitted member a serration in which inclined surfaces (81) and vertical surfaces (82) are alternately arranged in a circumferential direction;

wherein said transmitted member having on its surface facing said transmitting member a serration in which inclined surfaces (81) and vertical surfaces (82) are alternately arranged in a circumferential

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direction; and

each of said inclined surfaces of said transmitted member is arranged to be pressed to one of said inclined surfaces of said transmitting member.

5 6. A fluid controller according to either claim 3 or 4,
 wherein said transmitting member comprises a plurality of transmitting pieces having a circular surface facing said transmitted member;

 said transmitting pieces are arranged along the circumferential
10 direction of said transmitted member; and

 each of said circular surface is configured to be pressed to one of said inclined surfaces of said transmitted member.

 7. A fluid controller according to either claim 3 or 4,
 wherein said transmitted member comprises a plurality of
15 transmitted pieces having a circular surface facing said transmitting member;

 said transmitted pieces are arranged along the circumferential direction of said transmitting member; and

 each of said circular surface are arranged to be pressed to one of said
20 inclined surfaces of said transmitting member.

 8. A fluid controller according to either claim 6 or 7,
 wherein either said plurality of transmitting pieces or said plurality of transmitted pieces has a spherical shape.

 9. A fluid controller according to either claim 3 or 4,
25 wherein said receiving holes are configured as a ring-shaped groove;
and

said elastic bodies comprise springs having the same diameter as
said ring-shaped groove.